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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 08/811,742   | 03/06/1997  | HONGYONG ZHANG       | 0756-1641           | 1505             |
| 22204  | 7590        | 04/29/2004           | EXAMINER            |                  |
| NIXON PEABODY, LLP<br>401 9TH STREET, NW<br>SUITE 900<br>WASHINGTON, DC 20004-2128 |             |                      | NGUYEN, KHIEM D     |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2823                |                  |

DATE MAILED: 04/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|  |                            |  |  |
|--|----------------------------|--|--|
| <b>Office Action Summary</b>   | Application No.            | Applicant(s)   |  |
|  | 08/811,742                 | ZHANG ET AL.   |  |
|  | Examiner<br>Khiem D Nguyen | Art Unit<br>2823   |  |
| <i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i>   |                            |  |  |
| <b>Period for Reply</b>  |                            |  |  |
| <b>A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.</b>   |                            |  |  |
| <ul style="list-style-type: none"> <li>- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.</li> <li>- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.</li> <li>- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.</li> <li>- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).</li> <li>- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).</li> </ul> |                            |  |  |
| <b>Status</b>  |                            |  |  |
| 1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>05 February 2004</u> .   |                            |  |  |
| 2a) <input checked="" type="checkbox"/> This action is FINAL.                    2b) <input type="checkbox"/> This action is non-final.  |                            |  |  |
| 3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.  |                            |  |  |
| <b>Disposition of Claims</b>   |                            |  |  |
| 4) <input checked="" type="checkbox"/> Claim(s) <u>49-66 and 85-120</u> is/are pending in the application.   |                            |  |  |
| 4a) Of the above claim(s) <u>49-66</u> is/are withdrawn from consideration.  |                            |  |  |
| 5) <input type="checkbox"/> Claim(s) _____ is/are allowed.   |                            |  |  |
| 6) <input checked="" type="checkbox"/> Claim(s) <u>85-120</u> is/are rejected.   |                            |  |  |
| 7) <input type="checkbox"/> Claim(s) _____ is/are objected to.   |                            |  |  |
| 8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement.   |                            |  |  |
| <b>Application Papers</b>  |                            |  |  |
| 9) <input type="checkbox"/> The specification is objected to by the Examiner.  |                            |  |  |
| 10) <input checked="" type="checkbox"/> The drawing(s) filed on <u>05 June 1995</u> is/are: a) <input checked="" type="checkbox"/> accepted or b) <input type="checkbox"/> objected to by the Examiner.<br>Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).   |                            |  |  |
| 11) <input type="checkbox"/> The proposed drawing correction filed on _____ is: a) <input type="checkbox"/> approved b) <input type="checkbox"/> disapproved by the Examiner.<br>If approved, corrected drawings are required in reply to this Office action.  |                            |  |  |
| 12) <input type="checkbox"/> The oath or declaration is objected to by the Examiner.   |                            |  |  |
| <b>Priority under 35 U.S.C. §§ 119 and 120</b>   |                            |  |  |
| 13) <input checked="" type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  |                            |  |  |
| a) <input checked="" type="checkbox"/> All b) <input type="checkbox"/> Some * c) <input type="checkbox"/> None of:<br>1. <input type="checkbox"/> Certified copies of the priority documents have been received.<br>2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____.<br>3. <input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).<br>* See the attached detailed Office action for a list of the certified copies not received.  |                            |  |  |
| 14) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  |                            |  |  |
| a) <input type="checkbox"/> The translation of the foreign language provisional application has been received.   |                            |  |  |
| 15) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.  |                            |  |  |
| <b>Attachment(s)</b>   |                            |  |  |
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  |                            | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   |                            | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>120503</u> .  |                            | 6) <input type="checkbox"/> Other: _____                                     |  |

## DETAILED ACTION

### *Response to Amendment*

Applicant's arguments filed February 5<sup>th</sup>, 2004 have been fully considered but they are not persuasive.

The Rejection from paper No. Mailed October 28<sup>th</sup>, 2003 is incorporated in this paper. It is presented here for convenience.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 85-87, 90-93, 96-99, 102-105, 108-111, 114-117, and 120 are rejected under 35 U.S.C. 102(b) as being anticipated by Oka (JP-140915) (translation).

In re claims 85, 91, 97, 103, 109, 115, Oka discloses a method for manufacturing a semiconductor device comprising the steps of: forming a semiconductor film over a substrate (page 6, translation); disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film (page 14, translation); crystallizing the semiconductor film by heating (pages 6-7, translation), patterning the crystalline semiconductor film to an active layer including the selected portion (**FIG. 1(d)**); forming a gate insulating film (**FIG. 1 (d), element 108**) over the active layer, forming a gate electrode (**FIG. 1(d), element 106**) over the gate insulating film; forming an insulating film (**FIG. 1(d), element 109**) over the gate insulating film; and forming a wiring (**FIG.**

**1(d), element 111)** over the insulating film, wherein the wiring is connected to the selected portion and wherein the crystals extend along with a direction in which carriers of the thin film transistor flow (**FIGS. 1(b)-8** and related text).

Additionally, Oka discloses forming two gate electrodes (**FIG. 1(d), 1<sup>st</sup> gate electrode (106) and the second gate electrode (unlabeled)**) over the gate insulating film (**FIG. 1(d), element 108**) wherein the active layer constitutes a pair of N-channel and P-channel thin film transistors and wherein the crystals extend along with a direction connecting source and drain regions of the thin film transistor (**FIG. 1(b)-8**).

In re claims 86, 92, 98, 104, 110, and 116, Oka discloses wherein the crystallization promoting material comprises an element selected from the group consisting of Ni and Pt (page 14, translation).

In re claims 87, 93, 99, 105, 111, and 117, Oka discloses method according to claim 85, wherein the heating is performed at a temperature of approximately 200° C to 450° C (pages 6-7, translation).

In re claims 90, 96, 102, 108, 114, and 120, Oka discloses wherein the semiconductor device constitutes a driver circuit of an active matrix display device (**FIGS. 1(b)-8 and related text**).

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 88, 89, 94, 95, 100, 101, 106, 107, 112, 113, 118, and 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka (JP-140915) (translation) as applied to claims 85-87, 90-93, 96-99, 102-105, 108-111, 114-117, and 120 above, and further in view of Kuznetsov ((Inst. Phys. Conf) pages 191-194).

In re claims 89, 95, 101, 107, 113, and 119, Kuznetsov discloses that metal catalyst induced crystallization occurs by lateral diffusion of the metal throughout the a-Si film. In addition, Kuznetsov teaches a concentration of Ni<sup>+</sup> ions to a maximum concentration of about  $1.5 \times 10^{20}$  atoms/cm<sup>3</sup> (pages, 191-194). Thus, such diffusion, while not explicitly taught by Oka, is inherent in the process of Oka as a result of the metal induced lateral crystallization. It would have been obvious to one of ordinary skill in the art of making semiconductor devices to combine the teaching of Oka and Kuznetsov to enable the active layer contains the crystallization promoting material at a concentration of  $1 \times 10^{15}$  atoms/cm<sup>3</sup> or more of Oka to be formed and furthermore an enhanced rate of crystallization can be obtained (Abstract).

In re claims 88, 94, 100, 106, 112, and 118, the process wherein the crystallization promoting material is disposed by a spin-coating is well-known to one of ordinary skill in the art of making semiconductor devices. Additionally, Caune et al. (Applied Surface Science 36 (1989) pages 597-604) provides evidence that the process wherein the crystallization promoting material is disposed by a spin-coating is well-known to one of ordinary skill in the art of making semiconductor devices.

*Response to Amendment*

*Response to Applicant's Arguments*

Applicant's arguments filed February 5<sup>th</sup>, 2004 have been fully considered but they are not persuasive.

Applicants contend that the wiring layer of Oka (JP-140915) (translation) is not connected to the selected portion.

In response to Applicants' contention that the wiring layer is not connected to the selected portion, the examiner notes that the claims are given the broadest interpretation and in so providing a broad reasonable interpretation. The examiner fails to position that the active layer is the selected portion. The independent claims do not preclude any particular part of the active region to be the selected portion. Therefore Applicants' argument is moot. For these reasons, examiner holds the rejection proper.

*Conclusion*

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the

Art Unit: 2823

statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.  
April 26, 2004



**W. DAVID COLEMAN  
PRIMARY EXAMINER**